

Transistors

-500mA / -40V Digital transistors (with built-in resistor)

DTB143TK

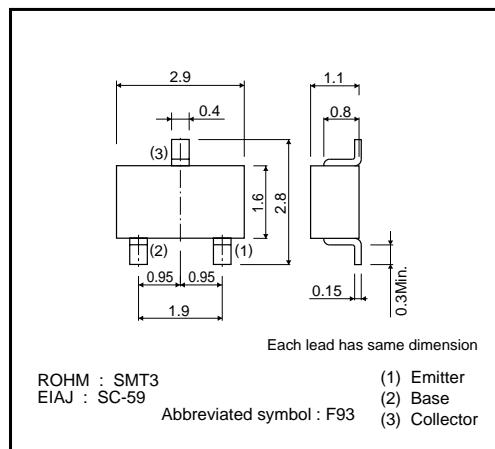
●Applications

Inverter, Interface, Driver

●Features

- 1) Built-in bias resistors enable the configuration of an inverter circuit without connecting external input resistors (see equivalent circuit).
- 2) The bias resistors consist of thin-film resistors with complete isolation to allow positive biasing of the input. They also have the advantage of almost completely eliminating parasitic effects.
- 3) Only the on / off conditions need to be set for operation, making the device design easy.

●External dimensions (Unit : mm)



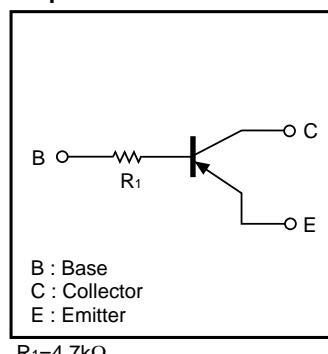
●Structure

PNP epitaxial planar silicon transistor
(Resistor built-in type)

●Packaging specifications

	Package	SMT3
	Packaging type	Taping
	Code	T146
Part No.	Basic ordering unit (pieces)	3000
DTB143TK		○

●Equivalent circuit



●Absolute maximum ratings (Ta=25°C)

Parameter	Symbol	Limits	Unit
Collector-base voltage	V _{CB0}	-50	V
Collector-emitter voltage	V _{CBO}	-40	V
Emitter-base voltage	V _{EBO}	-5	V
Collector current	I _C	-500	mA
Collector power dissipation	P _C	200	mW
Junction temperature	T _j	150	°C
Storage temperature	T _{stg}	-55 to +150	°C

Transistors

●Electrical characteristics ($T_a=25^\circ\text{C}$)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Collector-base breakdown voltage	BV_{CBO}	-50	-	-	V	$I_c=-50\mu\text{A}$
Collector-emitter breakdown voltage	BV_{CEO}	-40	-	-	V	$I_c=-1\text{mA}$
Emitter-base breakdown voltage	BV_{EBO}	-5	-	-	V	$I_e=-50\mu\text{A}$
Collector cutoff current	I_{CBO}	-	-	-0.5	μA	$V_{\text{CB}}=-50\text{V}$
Emitter cutoff current	I_{EBO}	-	-	-0.5	μA	$V_{\text{EB}}=-4\text{V}$
Collector-emitter saturation voltage	$V_{\text{CE(sat)}}$	-	-	-0.3	V	$I_c/I_B=-50\text{mA}/-2.5\text{mA}$
DC current transfer ratio	h_{FE}	100	250	600	-	$V_{\text{CE}}=-5\text{V}, I_c=-50\text{mA}$
Input resistance	R_i	3.29	4.7	6.11	k Ω	-
Transition frequency	f_T *	-	200	-	MHz	$V_{\text{CE}}=-10\text{V}, I_e=50\text{mA}, f=100\text{MHz}$

* Characteristics of built-in transistor

●Electrical characteristic curves

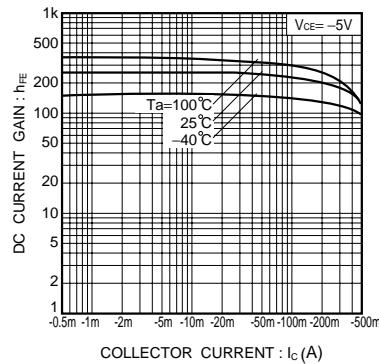


Fig.1 DC current gain vs. collector current

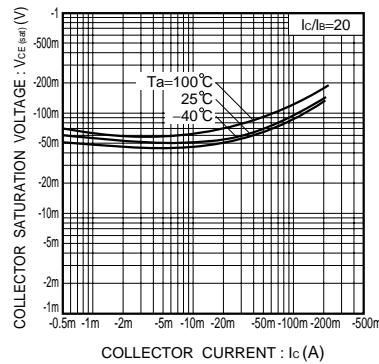


Fig.2 Collector-emitter saturation voltage vs. collector current

Appendix

Notes

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Тел: +7 (812) 336 43 04 (многоканальный)
Email: org@lifeelectronics.ru